

In re LeRoy G. Hagenbuch  
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of material into and from a body of the vehicle during the haul cycle;

second means for sensing a parameter that varies during the haul cycles and providing a second set of data indicative of the parameter;

an electronic processing means on-board the vehicle for acquiring the first and second sets of data from the first and second means, processing the data to provide a third set of data which defines a haulage event executed by the vehicle during haul cycles [and organizing the first set of data to provide information regarding the execution of a haulage event of the vehicle]; and

a storage medium for accumulating the third set of data [information] from the electronic processing means so as to create a historical data base of the haulage events [as defined by the information].

2. (Twice Amended) The system as set forth in claim 1 [including second means mounted to the vehicle for providing a] wherein the second set of data is indicative of a direction of movement of the vehicle [and delivering the second set of data to the electronic processing means to be incorporated into the information].

4. (Twice Amended) The system as set forth in claim [2 herein] 1 wherein the second means includes a device for detecting a forward-neutral-reverse status of a drive train associated with the haulage vehicle.

6. (Twice Amended) The system as set forth in claim 5 wherein the first means includes a sensor for detecting the raising of the body for unloading of the material in the body [and providing a third set of data indicative of the unloading to the electronic processing means to be incorporated into the information].

7. (Twice Amended) The system as set forth in claim 34 including a third means for [incorporating the elapsed times of the haulage cycles into the historical data base and a fourth means for] delivering control data based on the third set of data [information] in the historical data base for routing the vehicle to selected locations.

8. (Twice Amended) The system as set forth in claim [5] 1 including a third means responsive to the electronic processing means for downloading the third set of data [information] to a remote site which includes the storage medium.

9. (Twice Amended) The system as set forth in claim 8 wherein the remote site includes a central electronic processing means responsive to the downloaded third set of data [information] and the historical data base of haulage cycles for providing [a third set of] control data for use in directing a future operation of the vehicle.

10. (Twice Amended). The system as set forth in claim [9] 37 wherein the haulage vehicle is loaded by a bucket of a loading equipment and the ~~electronic~~ processing means includes means for determining the weight of each bucket in response to the first means and the third set of data includes the weight of each bucket [historical data base of haulage events includes an average weight of a bucket over a plurality of loading cycles for the loading equipment].

11. (Twice Amended) The system as set forth in claim 8 wherein the haulage vehicle is loaded by a bucket of a loading equipment, the [system] electronic processing means including fourth means responsive to the first and second sets of data for determining when material carried by the bucket is loaded onto the body and incorporating the determination into the information.

12. (Twice Amended) The system as set forth in claim 11 wherein the electronic processing means includes a fifth means [includes means] responsive to the first and second sets of data for determining an elapsed time from the loading of a first bucket in a load to the loading of a last bucket.

13. (Twice Amended) The system as set forth in claim 12 wherein the electronic processing means includes a [including] sixth means responsive to the first and second sets of data for recording the identity of the loading equipment and providing information in the third set of data associating the identity of the loading equipment with the event [determination] of loading [when] material held by the bucket into [is loaded onto] the body.

15. (Twice Amended) The system as set forth in claim 1 wherein the [including] second means monitors time and the third set of data includes [mounted to the vehicle for marking] the first set of data [from the first means] marked with an indication of a time the first set of data [is] was collected [and delivering the marked first set of data to the electronic processing means to be incorporated into the information].

18. (Twice Amended) The system as set forth in claim 1 wherein the [including second means for providing a] second set of data indicative is of the geographic location of the vehicle [and delivering the second set of data to the electronic processing means to be incorporated into the information].

20. (Twice Amended) A system for acquisitioning and accumulating data indicative of haul cycles [haulage events] executed by a haulage vehicle, the apparatus comprising:

first means mounted to the vehicle for providing a first set of data indicative of a loading of material onto a body of the vehicle during the haul cycle;

second means for providing a second set of data indicative of a relative time of the loading of the material sensed by the first means;

a electronic processing means on-board the vehicle for acquiring the first and second sets of data from the first and second means processing the data to provide a third set of data which includes an elapsed time associated with each haul cycle [and organizing the first and second sets of data to provide information regarding the execution of a haulage event by the vehicle]; and

a storage medium for accumulating the third set of data [information] from the electronic processing means

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so as to create a historical data base of the elapsed times [haulage events as defined by the information].

21. (Twice Amended) A system for acquisitioning and accumulating data indicative of [haulage events] haul cycles executed by a haulage vehicle having a pivotable dump body, the system comprising:

first means mounted to the vehicle for providing a first set of data indicative of a loading of material onto [a] the dump body of the vehicle;

second means for detecting the pivoting of the dump body into a dump position and providing a second set of data indicative thereof [of the unloading of the material by the body];

an electronic processing means on-board the vehicle for acquiring the first and second sets of data from the first and second means, processing the data to provide a third set of data which defines a haulage event executed by the vehicle during haul cycles [and organizing the first and second sets of data to provide information regarding the execution of a haulage event by the vehicle]; and

a storage medium for accumulating the information from the electronic processing means so as to create a historical data base of the haulage events as defined by the information.

22. (Twice Amended) A system for acquisitioning and accumulating data indicative of haul cycles [haulage events] executed by a haulage vehicle, the system comprising:

first means mounted to the vehicle for providing a first set of data indicative of a loading of material onto a body of the vehicle during a haul cycle;

second means for providing a second set of data indicative of a distance travelled by the vehicle;

third means for providing a third set of data indicative of a forward or reverse direction of movement by the vehicle;

a fourth means for providing a fourth set of data indicative of a relative time for each event recorded by the first, second and third means;

an electronic processing means on-board the vehicle for acquiring the first, [and] second, third and fourth sets of data from the first, [and] second, third and fourth means, processing the data to provide a fifth set of data which includes an elapsed time the vehicle is in each of the forward and reverse directions [and organizing the first and second sets of data to provide information regarding the execution of a haulage event by the vehicle]; and

a storage medium for accumulating the fifth set of data [information] from the electronic processing means

so as to create a historical data base of the first,  
second, third, fourth and fifth sets of data [haulage  
events as defined by the information].

23. (Twice Amended) A system for acquisitioning  
and accumulating data indicative of [haulage events] haul  
cycles executed by a haulage vehicle, the system  
comprising:

first means mounted to the vehicle for providing  
a first set of data indicative of a loading and unloading  
of material [onto] into and from a body of the vehicle  
during a haul cycle;

second means for providing a second set of data  
indicative of a geographic location of the vehicle;

an electronic processing means on-board the  
vehicle for acquiring data from the first and second  
means, processing the data to provide a third set of data  
which defines a haulage event executed by the vehicle  
during haul cycles [and organizing the data to provide  
information regarding the execution of a haulage events by  
the vehicle]; and

a storage medium for accumulating the  
information from the electronic processing means so as to  
create a historical data base of the haulage events as  
defined by the information.

24. (Twice Amended) A system for acquisitioning and accumulating data indicative of [haulage events] haul cycles executed by a haulage vehicle, the system comprising:

first means mounted to the vehicle for providing a first set of data indicative of a loading and unloading of material into and from [onto] a body of the vehicle;

second means for providing a second set of data indicative of an entity controlling the vehicle for each haul cycle;

an electronic processing means on-board the vehicle for acquiring the first and second sets of data from the first and second means, processing the data to provide a third set of data which defines a haulage event executed by the vehicle during haul cycles [and organizing the first and second sets of data to provide information regarding the execution of a haulage events by the vehicle]; and

a storage medium for accumulating the information from the electronic processing means so as to create a historical data base of the haulage events as defined by the information.

29. (Twice Amended) A system for tracking the time of a haul cycle for a haulage vehicle, the system comprising:

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first means mounted to the vehicle for sensing the loading and unloading of a load carried by the vehicle and providing respective first and second sets of data in response thereto; [and]

second means responsive to the electronic processing means for creating a data base from the elapsed times of the haul cycles and processing the data base to derive control data for commanding the routing of the vehicle to selected locations; and

an electronic processing means on-board the vehicle responsive to the first and second sets of data indicative of the loading and unloading of the vehicle for determining the elapsed time of a haul cycle for the vehicle.

33. (Once Amended) The system as set forth in claim 1 including third means mounted to the vehicle for providing a [second] fourth set of data indicative of the stopping of the vehicle and delivering the [second] fourth set of data to the electronic processing means to be incorporated into the third set of data [information].

34. (Once Amended) The system as set forth in claim 1 wherein the third set of data includes [including a second means responsive to the information for determining] an elapsed time for a sequence of loading and

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unloading [haulage] events, which define [defining] a haul  
[haulage] cycle.

35. (Once Amended) The system as set forth in  
claim 8 including a fourth means for providing a [third]  
fourth set of data indicative of the geographic location  
of the vehicle and delivering the [third] fourth set of  
data to the electronic processing means for inclusion in  
the third set of data [remote cite].

Please add the following new claim:

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37. The system as set forth in claim 1 wherein the  
first means includes a weighing device for continuously  
monitoring the weight of a load of material.

REMARKS

In the Office Action mailed June 19, 1991, claims 1-  
9, 11, 12, 15-29 and 31-36 were rejected under 35 U.S.C.  
§103 as being obvious in view of any one of U.S. Patent  
Nos. 1,261,508 to Gamble, 4,456,084 to Miller or British  
Patent 2,043,921 to Griffiths taken in combination with  
U.S. Patent No. 4,258,421 to Juhassz et al. The remaining  
claims 10, 13, 14 and 30 were objected to as being  
dependent upon a rejected base claim, but they were  
indicated as being allowable if rewritten in independent